

# AIR SERVICE INFORMATION CIRCULAR

(AVIATION)

PUBLISHED BY THE CHIEF OF AIR SERVICE, WASHINGTON, D. C.

Vol. IV

June 1, 1922

No. 352

## PERFORMANCE TEST OF NAVY VOUGHT TYPE XV EQUIPPED WITH WRIGHT MODEL E-2 ENGINE

(PERFORMANCE TEST REPORT No. 73)



Prepared by Engineering Division, Air Service  
McCook Field, Dayton, Ohio  
November 1, 1921



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1922

CERTIFICATE: By direction of the Secretary of War, the matter contained herein is published as administrative information and is required for the proper transaction of the public business.

(11)

# PERFORMANCE TEST OF NAVY VOGHT TYPE XV EQUIPPED WITH WRIGHT MODEL E-2 ENGINE.

## OFFICIAL PERFORMANCE TEST—SUMMARY OF RESULTS.

NOVEMBER 1, 1921.

Airplane: Navy Vought.  
No.: P-204.  
Type: XV.  
Engine: Wright, Model E-2.  
Propeller: X-6233, A. S. No. 60340.  
Equipped as: Advanced training.  
Weight empty (including water): 1,569 pounds.  
Armament and equipment: 140 pounds.  
Crew: 360 pounds.  
Gasoline: 177.5 pounds.  
Oil: 22.5 pounds.  
Weight loaded: 2,269 pounds.  
Weight, square foot: 7.96 (285 square foot R. A. F.-15).  
Weight, horsepower: 12.2 (194 horsepower at 1,830 revolutions per minute).  
Fineness: 113.5 Ae-5.7.

Stand- ard altitude in feet.	Climb.				Speed.		
	Time in min.	R. P. M.	Rate ft./min.	Flow gal./hr.	M.P.H.	R. P. M.	Flow gal./hr.
0	.....	1,620	1,070	.....	124	1,830	.....
6,500	7.3	1,610	735	.....	122	1,790	.....
10,000	12.6	1,605	565	.....	120	1,760	.....
15,000	24.4	1,585	315	.....	113	1,690	.....
20,000	.....	.....	.....	.....	.....	.....	.....
25,000	.....	.....	.....	.....	.....	.....	.....
<sup>1</sup> 19,200	48.5	1,565	100	.....	102	1,615	.....
<sup>2</sup> 21,200	.....	1,550	0	.....	84.5	1,550	.....

<sup>1</sup> Service ceiling.

<sup>2</sup> Absolute ceiling.

Endurance, full throttle at 10,000 feet (including climb):  
2 hours 28 minutes.

Minimum speed at sea-level (lowest throttle): 60 miles  
per hour.

Landing speed:

## PILOT'S OBSERVATIONS.

### FLYING QUALITIES.

*Taxi-ing.*—Somewhat difficult to taxi in strong wind.

*Take off.*—Responds well to controls during run. Takes  
off easily with short run.

*Landing.*—Lands easily and slowly. Has slight tend-  
ency to spin on ground, which can usually be corrected  
without use of the throttle. Has flat gliding angle. Will  
float for considerable distance if brought in too fast.

*Stability.*—Lateral, very good. Longitudinal, stable  
throughout range of speeds and throttle settings; stable on  
glide. At stalling speed tends to fall into spin.

*Maneuverability.*—Ease of control, good. Response to  
control, rapid. Handles easily in all maneuvers. Holds  
steep banks well and turns sharply, but will fall into spin  
if pulled in too tight. Spins rapidly, but recovers quickly.  
Can not be rolled with safety, as leading edges of wings  
are weak.

### VISIBILITY.

Rear seat, good in all directions.

Front seat, poor for combat, formation flying, or cross-  
country flying, fair for landing.

### MAINTENANCE.

Airplane is excellent from point of view of maintenance.  
Two machines of this type were flown, one for 50 hours and  
the other for 100 hours, without any important troubles  
being experienced. Both of these airplanes were in com-  
mission practically all of the time.

The engine mounting is very good. All engine acces-  
sories are easily reached. Very little vibration is notice-  
able.

### SUMMARY.

The flying qualities of this airplane are very good, its  
maintenance is simple, and, in general, it is very efficient.  
It is too sensitive on the controls for preliminary training,  
but would be a good machine for advanced training.

## DISTRIBUTION OF WEIGHTS.

[By pounds.]

Weight empty (with water): 1,569.

Armament and equipment: 140.

Crew: 360.

Gasoline: 177.5.

Oil: 22.5.

Weight loaded: 2,269.

Weight on front wheels (tail skid on ground): 1,983.

Weight on tail skid (tail skid on ground): 286.

Weight on front wheels (flying position): 2,087.

Weight on tail skid (flying position): 182.

Center of gravity (distance from wheels in flying posi-  
tion): 15.5 inches. Distance center line of axle to point  
of support of tail skid: 16 feet 1 inch.

Provisions for special equipment not carried during test.

## DESCRIPTION OF AIRPLANE.

### DIMENSIONS.

Overall span: 34 feet 5½ inches  
 Overall length: 24 feet 8½ inches.  
 Overall height: 8 feet 4½ inches.  
 Height at hub of propeller above ground:  
   In flying position: 4 feet 2 inches.  
   At rest: 5 feet 10½ inches.

### AIRPLANES.

Sweepback: None.  
 Dihedral: 1 degree 15 minutes.  
 Stagger: 11½ inches.  
 Total area including ailerons: 274.39 square feet.  
 Gap: 4 feet 8 inches.

### UPPER PLANE.

Including center section.

Span: 34 feet 5½ inches.  
 Chord: 4 feet 7 inches.  
 Area, with ailerons: 143.07.  
 Incidence: 1 degree 45 minutes.

### LOWER PLANE.

Span: 34 feet 2½ inches.  
 Chord: 4 feet 7 inches.  
 Area: 131.32 square feet.  
 Incidence: 2 degrees 15 minutes.

### AILERONS OR FLAPS.

Number: 4.  
 Arrangement: 2 on upper and 2 on lower wing.  
 Upper length: 6 feet 8 inches.  
 Upper chord: 1 foot 6 inches.  
 Upper area: 2 at 10.01=20.02 square feet.  
 Lower length: 6 feet 8 inches.  
 Lower chord: 1 foot 6 inches.  
 Lower area: 2 at 10.01 square feet=20.02 square feet.  
 Total area: 40.04 square feet.  
 Distance from center of ailerons to longitudinal axis of airplane: 13 feet 10 inches.

### CENTER SECTION.

Area: 15.08 square feet.  
 Dimensions: 4 feet 7 inches by 4 feet 7 inches.  
 Contents: None.

### STABILIZER.

Area: 9.45 square feet.  
 Setting: Zero with thrust line.

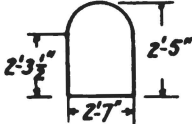
### ELEVATOR.

Area: 15 square feet.  
 Distance from leading edge of elevator to center of gravity of airplane: 16 feet 1½ inches.

### RUDDER.

Area: 7.2 square feet.  
 Distance from leading edge of rudder to center of gravity of airplane: 16 feet 4½ inches.

### FUSELAGE.

Max. cross section shape.   
 Max. cross section area: 2 feet 7 inches.  
 Max. cross section dimension: 2 feet 5 inches by 2 feet 7 inches.  
 Distance of maximum section from leading edge, lower plane: 1 foot 8½ inches.

### LANDING GEAR.

Number of wheels: 2.  
 Tread: (tires 26 by 4), 5 feet 2 inches.  
 Shock absorbing system: Rubber cord.  
 Braking device: Tail skid.  
 Wheels ahead of center of gravity, 15.5 inches.

### FIN.

Area: 2 square feet.

## DESCRIPTION OF POWER PLANT.

### ENGINE.

Make: Wright E-2.  
 Factory No.: ———.  
 A. S. No.: 95029.  
 Type: V—8 cylinder.  
 Number in plane: 1.  
 Location: Nose of fuselage.  
 Rated horsepower: 190.  
 Rated revolutions per minute: 1,800.  
 Bore: 4.724-inch (120 mm.).  
 Stroke: 5.118-inch (130 mm.).  
 Compression ratio: 5.5: 1.  
 Weight, dry: 476.  
 Gas consumption: 0.493 pound per horsepower hour.  
 Oil consumption: 0.0193 pound per horsepower hour.  
 Weight of water in engine: 44 pounds.

### IGNITION.

Battery or magneto: Magneto.  
 Make: Dixie No. 800.  
 Number: 2.  
 Advance, degrees: 25.  
 Gas interrupter: 0.018.  
 Distributor: None.  
 Plugs, make: A. C.  
 Type: Metal body, porcelain insulator.  
 Gap: 0.020.

### CARBURETORS.

Make: Stromberg.  
 Type: NAD 4.  
 Number: 1.  
 Main setting jet: 42 drill size.  
 Choke: 1½-inch.  
 Compensator body metering nozzle: No. 30.  
 Gas drains: From intake to copper tube outside of fuselage.  
 Air intake: Through stack in slip stream.  
 Altitude control: Back suction.

**RADIATORS.**

Make: Rex Radiator Mfg. Co.  
 Type: Honeycomb.<sup>1</sup>  
 Number: 1.  
 Position: Nose.  
 Frontal area: 3.27 square feet.  
 Core depth: 4 inches.  
 Length: 33 inches.  
 Width: 25 inches.  
 Radiator surface: 130 square feet.  
 Temp. adj.: Shutters.  
 Water capacity: 5.5 gallons.  
 Flow, gallons per minute: 40 gallons per minute at 2.5 pounds pressure. Cools on temperature diff. of 60° C., which allows full climb without boiling when the ground temperature is approx. 32° C, 90° F.  
 Thermometers, make: Boyce Model O.  
 Weight, pounds: 65.  
 Water capacity of whole system: 10 gallons.

**EXHAUST PIPES.**

Description: Short stacks, leading into manifolds, one on each side.

**LUBRICATION.**

Capacity oil tank: 3 U. S. gallons.  
 Dimensions oil tank: \_\_\_\_\_.

<sup>1</sup> See drawing No. 045842-5.

Oil used (brand): Liberty.

Oil pressure: 53 pounds per square foot.

Temperature: 140° F.

Type pump: Gear.

Wet or dry sump: Dry.

If wet, capacity: \_\_\_\_\_.

Description lubrication system: Standard, pressure feed.

**FUEL SYSTEM.**

No. of tanks: 2, Main.

Location: One, rear of engine; one under rear seat.

Capacity: Both tanks, 177.5 pounds. One tank 20 gallons; one tank 10 gallons.

Description of fuel supply system: Air pressure; selective as to either or both tanks.

**ENGINE CONTROL.**

Description: Rod and lever.

**PROPELLER.**

Make: Engineering Division.

Number blades: 2.

Diameter: 8 feet 6 inches R. H.

Pitch: 6.04 feet.

Tips: Terne date.

Clearance: \_\_\_\_\_.

Manufacturer's No. \_\_\_\_\_.

A. S. No.: x-60340.

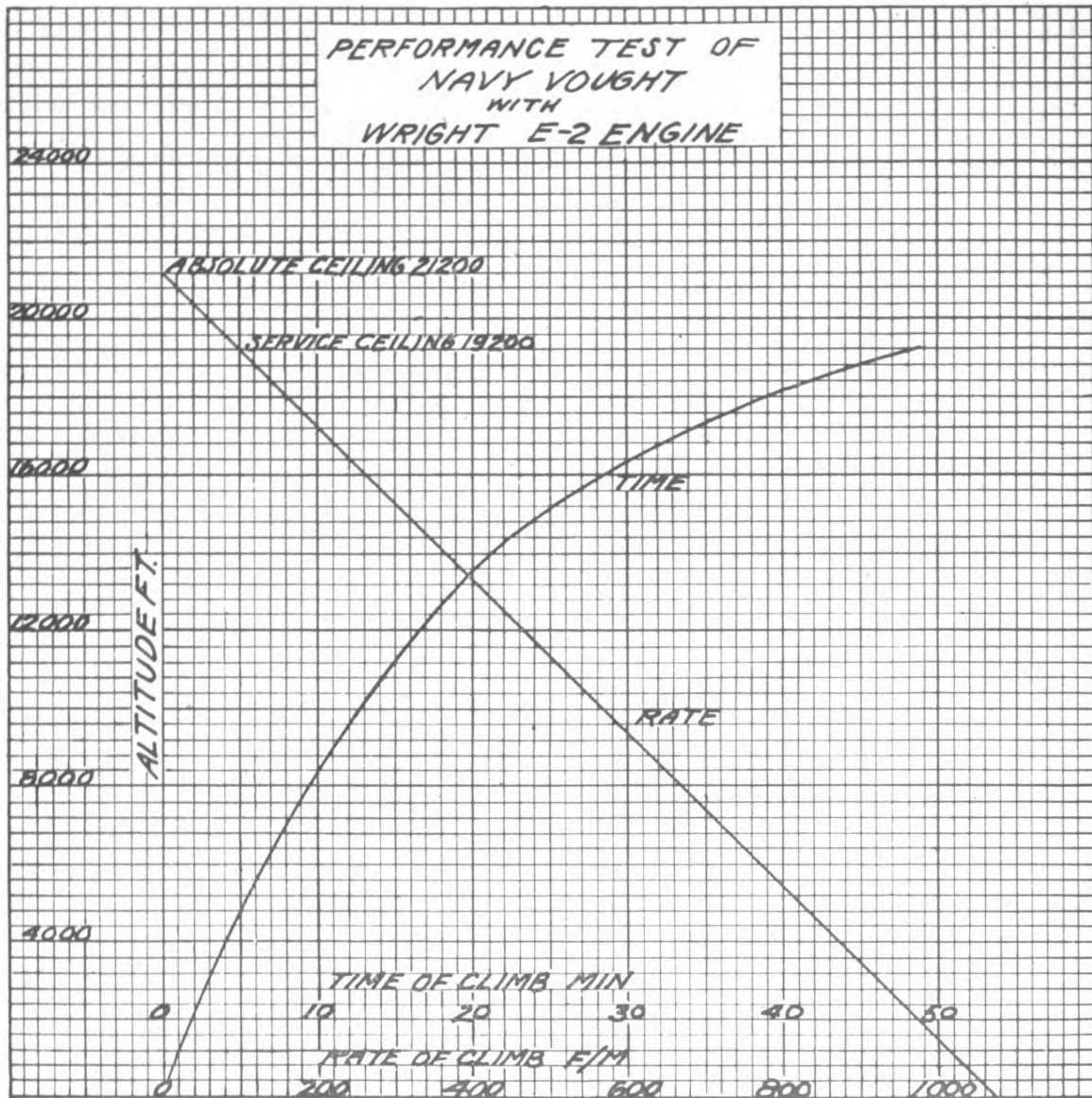


FIG. 1.

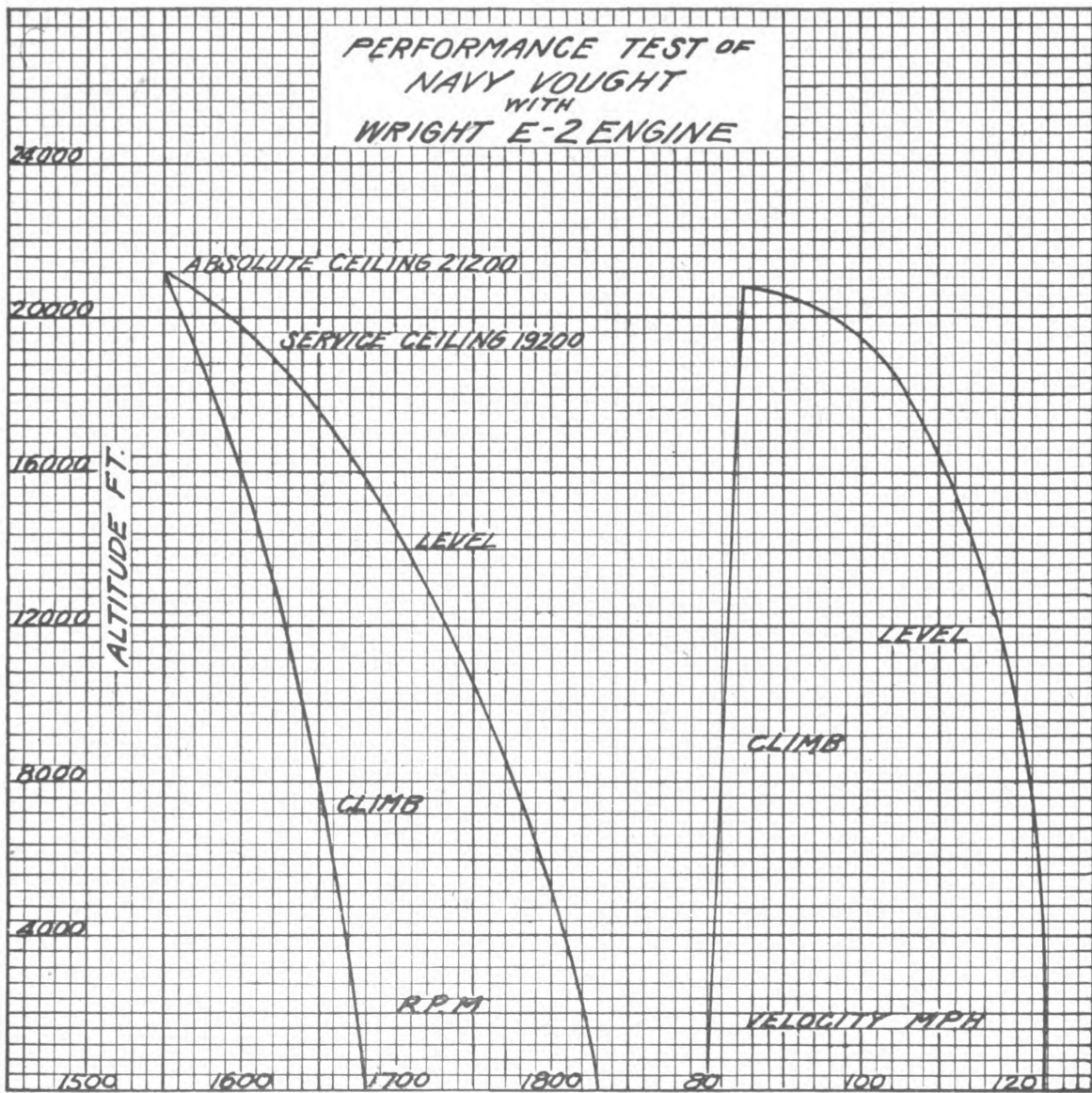


FIG. 2.

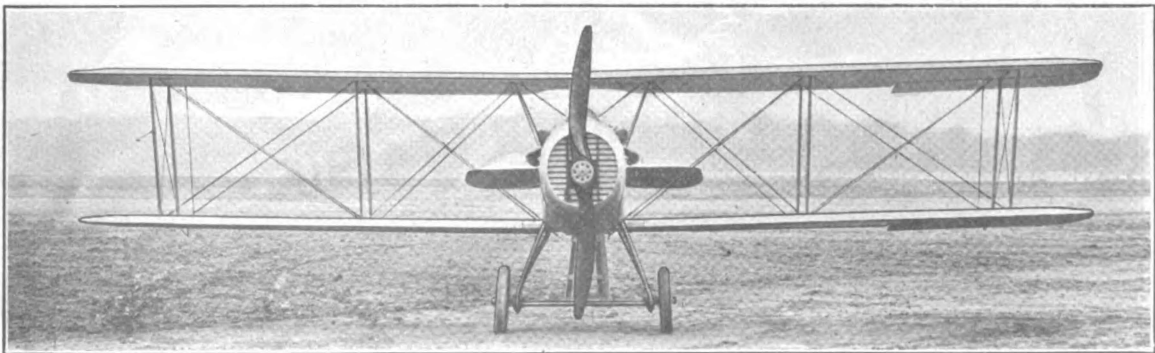


FIG. 3.

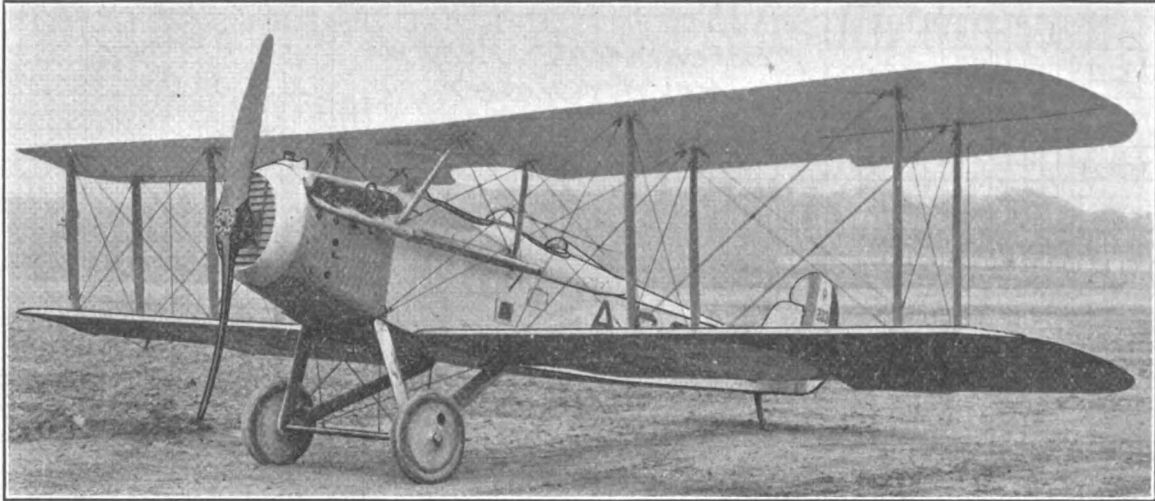


FIG. 4.



FIG. 5.



FIG. 6.

